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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,060	10/29/2003	Vladimir Grushin	PE0649USDIV1	5927

23906 7590 03/20/2006

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WILMINGTON, DE 19805

EXAMINER

SMOOT, STEPHEN W

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 03/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/696,060

Applicant(s)

GRUSHIN ET AL.

Examiner

Stephen W. Smoot

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 15, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15 and 20 is/are allowed.
- 6) ☒ Claim(s) 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

This Office action is in response to applicant's RCE filed on 10 March 2006.

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's amendment filed on 10 March 2006 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuboyama et al. (US 2003/0054198 A1) in view of Baldo et al. (WO 00/70655) and Forrest et al. (US 6,894,307 B2).

Tsuboyama et al. disclose iridium (Ir) metal complexes for use in electroluminescent devices. The ligands on the iridium metal ion include, *inter alia*, two, substituted or unsubstituted 2-phenylpyridines and one unsubstituted or a methyl- or fluoro-substituted 8-quinoline [p. 7, formula 42 and p. 12, formulas (11) and (13)]. Each of the 2-phenylpyridines may be substituted with fluorine and trifluoromethyl at any location on the rings (p. 4, paragraph [0047]-[0049]), which reads on the claimed two ligands of 2-(4-fluorophenyl)-5-trifluoromethylpyridine. Also, Tsuboyama et al. disclose that the iridium complexes are used in the light-emitting layer of an electronic, light-emitting device (Figs. 1-5; p. 22, paragraphs [0145]-[0160]).

However, Tsuboyama et al. do not expressly teach or suggest that the methyl group of the 8-quinoline as shown on p. 12, formula (13) is located at the same location on the nitrogen ring, that is, specifically bonded to the carbon adjacent the nitrogen as claimed in claim 19. Further, Tsuboyama et al. do not expressly teach or suggest that the iridium complexes be used in an electron transport layer, which is also a limitation of applicant's claim 19.

Baldo et al., like Tsuboyama et al. disclose substituted ligands for electroluminescent Ir metal complexes, and teach that the substituent groups can be located in any position on either ring of the ligands. Baldo et al. indicate that moving the

functional group can advantageously be used to alter emissive properties like color emission and carrier transport (Baldo et al., pp. 14-15). Forrest et al. suggest that materials used to produce electroluminescent emission may also be used in an electron transporting layer (see column 7, lines 29-34).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to locate the substituents of Tsuboyama et al. at each specific location on the 8-quinoline ring to beneficially affect the emissive properties of the Ir complex, as taught by Baldo et al., to thereby gain a broader range of color emissions. It also would have been obvious to use the iridium complexes in an electron transporting layer, as suggested by Forrest et al., because Forrest et al. recognize that the same materials used to produce electroluminescent emission can also function as an electron transport layer (see column 7, lines 31-34).

#### ***Allowable Subject Matter***

4. Claims 15, 20 are allowed.

5. The following is a statement of reasons for the indication of allowable subject matter:

- Claim 15 is allowed because the prior art of record does not teach or suggest, in combination with the other claim limitations, an organic electronic device that includes an emitting layer that contains at least 20 weight % of an iridium

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compound that has the applicant's as claimed sixth formula, wherein L' is a trifluoromethyl phenyl phosphine, a dimethyl phenyl isocyanide, a trifluoromethyl phenyl isocyanide, or a toluenesulfonylmethyl isocyanide; and

- Claim 20 is allowed because the prior art of record does not teach or suggest, in combination with the other claim limitations, an organic electronic device that includes an emitting layer that contains at least 20 weight % of an iridium compound that has the applicant's as claimed sixth formula, wherein L' is an isonitrile that includes an isonitrile substituent on an aromatic group.

### ***Response to Arguments***

6. Applicant's arguments filed on 10 March 2006 regarding the rejection of claim 19 under 35 USC 103(a) (see page 7), have been fully considered but they are not persuasive.

In response to applicant's arguments against the references individually (namely, Forrest et al.), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

It is agreed that Forrest et al., when taken alone, does not expressly teach that iridium complexes may be used in an electron transport layer. However, Forrest et al. is relied on in the applied prior art combination for their teaching that the emissive layer

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and the electron transport layer (as well as the hole transport layer) may be made from the same materials as described in column 7, lines 29-34 (also see column 7, lines 34-61). Accordingly, Forrest et al., when combined with the teachings of Tsuboyama et al. and Baldo et al., would at least qualify as a suggestion that the applicant's iridium complexes (as claimed in claim 19) may be used in an electron transport layer.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS

*Stephen W. Smoot*

**STEPHEN W. SMOOT  
PRIMARY EXAMINER**